

Explain customer participation model in banking industry value co-creation with a mixed approach of dematel and system dynamics

Mohammad Reza Ebadpour Farshbaf, Yaqub Alavimatin*, Morteza Mahmoudzadeh, Alireza Bafandeh Zendeh

Department of Management, Tabriz Branch, Islamic Azad University, Tabriz, Iran

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Abstract

Customer participation in the organization's value creation through the integration of resources, which most organizations have recently considered under the title of value co-creation, has been accepted as an efficient strategy of interaction with customers [84], which is applied in all processes of solving problems and meeting customer needs. Therefore, this article addresses the customer participation model explanation and its consequences in organization and customer value co-creation in the banking industry. This can contribute to knowledge boundaries development in the prevailing logic of services and value co-creation in the banking industry. Considering the complexity of the relationships between the factors affecting the system, this paper explained the relationships and the impact of key factors in the system's causal loops by combining the methods of Dematel and systems dynamics. This paper adopts a mixed methodology. Thus, the qualitative phase goal is exploratory accounting for the conceptual model development, and the quantitative phase goal is to quantify the conceptual model. Therefore, this article is qualitative, exploratory, and developmental in the quantitative dimension, while applied in the quantitative dimension. The results showed that the investment was the most effective factor, the intention to use was the most affecting factor, and system quality and customer satisfaction showed the highest amount of interaction among the factors, with customer participation in providing services being a new addition to the main perspective in the literature of customer satisfaction and service industry.

Keywords: customer participation, customer participation value, value co-creation, banking industry, dematel, system dynamics

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1 Introduction

Global processes and the expansion and penetration of information technology in businesses have transformed operations and economic processes, and transformed the customers' relationship with banks and credit institutions that are at the center of economic and financial activities [38]. In these competitive conditions, all banks and financial institutions are looking for different business strategies to attract new customers and retain their current customers to

*Corresponding author

Email addresses: mr.ebadpour44@gmail.com (Mohammad Reza Ebadpour Farshbaf), alavimatin@iaut.ac.ir (Yaqub Alavimatin), m.mahmoudzadeh@iaut.ac.ir (Morteza Mahmoudzadeh), a.b.zendeh@gmail.com (Alireza Bafandeh Zendeh)

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achieve the desired goal by maintaining and continuing the momentum of growth and increasing their market share. Thus, for a business to attain its goals and success requires the decision of customers to choose it as a supplier of required products and services; therefore, the banks and financial institutions' goal in this case is the customer's decision to choose it as a partner in economic activities.

The customer's decision to invest in the bank, provide financing, or benefit from other bank services is always based on rational considerations, depending on factors such as a large number of choices and variety of products offered by competitors, and the possibility of replacing the financial service provider at a low cost. On the other hand, different levels of customer expectations have become one of the main inhibiting factors to adapting the facilities and benefits of a product/service according to the customer's needs and improving their satisfaction. Therefore, banks make various efforts to trust and loyalty become their main priority while achieving customer satisfaction. In addition, obviously, under such conditions, one of the main success factors is to create a relationship called customer interaction. This relationship provides that progress in the participation loop turns the customer into a fan [66]. Customer participation is a strategic necessity to achieve a superior competitive advantage [68] and sales and profitability growth and is the result of the relationship development and nurturing process [68]. In this case, the customer's behavioral manifestation towards the brand is defined beyond purchasing behavior. This behavioral manifestation may be in ways other than purchase, including referrals and word-of-mouth advertising, participation in company activities, innovative suggestions, expressing experiences to improve service, the voice of the customer, or influencing the company and its constituents by participating in brand communities [8].

According to Zhang and Chen [91], focusing on interaction and partnership with customers can help the company and customer achieve new competencies, and thus the company achieves a bigger competitive advantage. Therefore, the main problem of this research is to answer the question of "how to develop value co-creation in the banking industry through customer participation?" Presenting this model can help increase the existing theoretical knowledge, achieve a competitive advantage, and other achievements resulting from the banking industry value co-creation development.

2 Theoretical foundations and research background

2.1 Customer participation

Over the past few decades, business in all sectors has increasingly moved toward relationships, networks, and interactions [87]. Customer participation is a form of implementing relationships, networks, and interactions and is conceptualized as a type of customer interaction and communication with a company that goes beyond purchasing behavior and has attracted the attention of business owners and researchers based on the increase of psychological and emotional relationships [7, 10, 60, 90]. The importance of this concept in customer relationship management activities [44] and its ability to create constructive situations and define customers as part-time collaborators have made customer participation an essential factor in creating shared value [82]. Some researchers associate customer participation with a psychological process that guides customer loyalty. Researchers define that "repeated interactions strengthen a customer's emotional, psychological, or physical investment in a brand" [67]. However, information systems researchers view "customer engagement" as "the intensity of customer engagement with organization representatives and other customers in the collaborative knowledge exchange process" [86]. Bowden [67] models customer participation as a psychological process with its main mechanism enabling new customers' loyalty to a business/service and repurchasing the product/service. Sedley [68] defines customer participation as the process of relationship development and nurturing. Accordingly, the product and the price are not focused on, and the relationship has reached the highest level, and a strong emotional affinity has been created between the company and the customer. The multi-dimensional use of the term interaction concerning cognitive, emotional, and/or behavioral aspects is related to the discourse of business performance. Thus, customer participation includes logical loyalty (namely, overall satisfaction, repurchase intention, and introduction of the product to others' intention) and emotional affiliation (namely, trust and customer attitude towards a brand, belief in its integrity, pride in the brand name and passion for it) [86].

2.2 Customer participation value

In the current literature, co-creation by the company's customer couple is focused on the benefits of increasing the scope of customer participation in the process of production and service delivery, and company managers are looking for different innovative methods for extensive and profitable partnerships to attract and retain customers. According to the dominant service logic, customers are active actors who can develop and personalize their relationships with product suppliers and take on many different roles. The customer can be a payer, a consumer, a competence provider, a quality controller, a co-producer, or a co-marketer [76]. According to Normann and Ramirez [56], the co-production

of products that motivate customers is the key to creating value. However, the value creation process (customer) can be defined as a set of activities that are performed by the customer to achieve a specific goal. One of the key aspects of the customer's ability to create value is the amount of information, knowledge, skills, and other operational resources that they can access and use [55]. The psychological sense of experience, benefit from co-creation, and a sense of satisfaction in being part of what customers have paid for, underpins customer engagement. Anderson et al. [4] define satisfaction as the evaluation of customers' purchase and consumption experience. Similarly, customer satisfaction is broadly described as the evaluation of product/service quality after purchase versus pre-purchase expectations [41]. According to Oliver [57], customer satisfaction is related to the complete fulfilment of individual needs. Current literature also suggests that customer satisfaction is the customer's feeling, attitude, or desire toward a product/service after using it. Implicitly, if customers are satisfied after using the given product/service, there is a possibility of repeat purchases and other added products [18]. Taylor and Baker [78] identify customer satisfaction as an important factor in predicting customers' potential purchase intention. When consumers are satisfied and participate in positive word-of-mouth recommendations (word-of-mouth advertising) [27], it is easy for them to inform others about their excellent experience. File and Prince [22], Van Thanh et al. [81], and Kumar and Reinartz [45] emphasizing customer value, argue that the purpose of business is to create value for customers in the first place, and in the second place, to receive value from the customer and finally to create value for the company. Pansari and Kumar [60] believe that customer participation is the result of marketing activities, and the customer can create value for the company through their behaviors. In this regard, Kumar et al. [43] considered four types of value as the result of customer participation:

Customer Lifetime Value (CLV): One of the requirements of customer relationship management is to calculate and determine the current value of customers, their potential and future value for the organization [62], which is measured to optimally allocate resources to customers. Kumar et al. [42] repurchase and the more use of the company products and services by the customer, which leads to the current and future profitability of the company, is identified as the Customer Lifetime Value (CLV).

Customer Referral Value (CRV): It is a type of word-of-mouth advertising that, as a result of incentive programs implemented by the company, motivates actual customers to introduce and attract potential customers [43]. Customers in persuasive and informative roles have the most positive effect on the desire to refer to advertising [53]. Customer referrals play a significant role in reducing the costs of customer acquisition and increasing the company's income. Therefore, companies, while creating a customer database, encourage customers to give recommendations to others to buy products. Companies reward existing customers, so service managers should look for ways to improve the referral behavior of their existing customers by using the customer database [73].

Customer Influence Value (CIV): It is a form of word-of-mouth advertising for the company where active customers voluntarily share their consumption experience with other customers. Word of mouth is the exchange of positive or negative opinions about a company's products. Such opinions may have a significant impact on consumer behavior [19, 28]. Findings show that the effectiveness of word-of-mouth advertising in changing consumers' attitudes and influencing their purchase decisions is more than advertising or even direct sales [16, 17, 40, 52] also introduce word-of-mouth advertising as the most powerful means of advertising to attract and retain customers.

Customer Knowledge Value (CKV): refers to the transmission of innovative ideas, preferences, demands, and needs of the customer through providing feedback to the company that can help to innovate, develop contact points or improve the existing product [37]. In this regard, companies design their contact points and service delivery process in a way that creates favorable customer feedback. On the other hand, customers have heterogeneous behavior and complex responses [26]. They continuously evaluate their experience and revise their choice of communication channel during the process [3]. Customer channel selection is based on perceived usefulness and the benefits that customers seek from their interactions [6]. When choosing a channel, customers evaluate search costs, opportunity costs, and cognitive effort against potential risk reduction and convenience [47]. Therefore, they are likely to reduce the effort and perceived risk associated with the channel and interact with those more familiar with it [3, 32]. Customer channel behavior has evolved with the development of the Internet and digital platforms [51], and it has been possible for customers to change and integrate channels more easily than ever before [34]. In general, emerging communication technologies challenge the existing touchpoints and value chains of companies and enable the provision of new service solutions to meet evolving customer expectations [58, 79] to create more opportunities to interact with customers and improve customer retention and acquisition rates [24]. Technology adoption rates can also increase if customers recognize the benefits. If customers believe that new technologies improve their purchasing performance and make the process more enjoyable without requiring much effort to use, they are more likely to adopt new technology. Davis [15] introduced perceived ease of use and perceived usefulness as technology acceptance factors in the acceptance model of technology, and the innovation diffusion theory presented by Rogers [64] presents innovation acceptance as a process of gathering information and reducing risk with a tendency towards technology evaluation. However, customers at

different stages of channel adoption have different needs and technological readiness levels, and customer responses to the introduction of new technological products can vary from excitement to anxiety [80]. Novel service users for the first time may experience a certain degree of confusion because of unfamiliarity, but experience accumulated over time can reduce mistrust of new product touchpoints [80]. Trust is an important factor in attracting and maintaining customers [65]; therefore, companies need to know their customers and adjust their contact points on this basis [79] the lack of convenience due to a new contact point, or a reduction in an innovative call [23].

3 Methodology

The subject of the customer has been raised in marketing studies for decades, and customer participation is complex and multi-dimensional, like most of the issues in this field, due to the non-linear effect of each of the factors affecting it, as well as the mutual effects of the activities on each other. Therefore, in this article, the value of customer participation in value co-creation in the banking industry is discussed with the system dynamics methodology. This methodology is one of the important and modern non-linear theories based on systems thinking in a complex environment [74]. The methodology of this research is of a mixed type. In this way, in the qualitative phase, the goal is exploratory and the development of a conceptual model is taken into account, and in the quantitative phase, the goal is to quantify the conceptual model. Therefore, it can be said that the current research is qualitative, exploratory and developmental, and quantitative. The statistical population of the research consists of 12 experts in the field of banking, marketing, and information technology, which were selected by using a combination of targeted methods of judgment and snowball and based on having more than 10 years of experience in the relevant field, having motivation, suggested by others and a master's degree and doctorate. An extensive subject literature review using the library method and available articles led to the identification of 23 factors. After screening by experts, headquarters managers, and queues in the banking network, three factors were eliminated, and 20 factors were selected. Multi-criteria decision-making was used to determine and evaluate the relationships between factors. Finally, the cause and effect model as well as the flow and accumulation model were presented to obtain a comprehensive view of the system and better understand the dynamic relationships between factors.

4 Data analysis and research findings

After extracting the factors from the theoretical bases and interviewing the experts, 20 factors affecting the research subject were identified as described in Table 2. Table 1 also mentions some supporting studies and theories.

Table 1: Supporting studies and theories

Researches	Factors
[15, 20, 31, 33, 35, 50, 59, 69]	perceived usefulness, perceived ease of use
[13, 14, 18, 46, 49, 59, 61, 69]	Attitude to use, intention to use
[5, 10, 45, 60, 72, 76]	perceived usefulness, perceived ease of use
[1, 13, 29, 46, 69, 83, 85]	Customer participation in value creation
[54, 58, 70, 77, 79]	System quality and support
[16, 17, 19, 28, 40, 43, 52, 92]	Development of banking technology and new services
[11, 21, 30, 43, 42, 63, 71]	Customer recommendation and word of mouth
[12, 36, 48, 61]	Customer training and knowledge
[3, 14, 25, 32, 47, 80]	Previous experience and habit

Table 2: Factors affecting customer participation in value co-creation in the banking industry

Factor	Code	Factor	Code	Factor	Code	Factor	Code
Perceived usefulness	M1	Attitude to use	M6	Word of mouth advertising	M11	Leaving banking technology	M16
Perceived ease	M2	Intent to use	M7	Advertising and marketing	M12	Potential customers	M17
System quality	M3	Diversity and development services	M8	Getting used to banking technology	M13	Active customers	M18
Customer satisfaction	M4	Perceived risk	M9	Modern services	M14	Use of banking technology	M19
Customer trust	M5	Accumulation of problems	M10	Customer knowledge	M15	Investment	M20

Moreover, the Dematel method was used to identify the relationship between the elements affecting the system. This technique identifies the structure of complex causal relationships and internal dependence between factors, makes them

understandable, and determines their impact and importance as a numerical score [88]. To implement the Dematel technique, the five following steps were implemented in the Office Excel (3) and MATLAB 4 software environment, according to Wu and Shen [89].

First, experts' opinions were applied to them based on the verbal scale with different degrees of "impact" according to Table 3 in 12 matrices of 20×20 sets of pairwise comparisons.

Table 3: Correspondence of verbal expressions and verbal values

Verbal phrases	Verbal values
Very high significant	4
High significant	3
Low significant	2
Very low significant	1
Insignificant	0

Then, the direct correlation matrix was calculated from the simple average of expert pairwise comparisons (Table 4).

$$X = \begin{bmatrix} 0 & \cdots & x_{n1} \\ \vdots & \ddots & \vdots \\ x_{1n} & \cdots & 0 \end{bmatrix} \quad (4.1)$$

For matrix-normalization, each row of the direct correlation matrix was divided by k , which is the largest number of the sum of rows and columns ($k = (0.0588)$).

$$k = \max \left\{ \max \sum_{j=1}^n x_{ij}, \sum_{i=1}^n x_{ij} \right\}, \quad N = \frac{1}{k} \times X \quad (4.2)$$

The complete correlation matrix was calculated by taking into account the guarantee of convergence to the inverse matrix, through formula (4.3).

$$T = \lim_{k \rightarrow +\infty} (N^1 + (N^2 + \dots + (N^k))$$

$$T = N \times (1 - N)^{-1} \quad (4.3)$$

To calculate the internal communication matrix, the threshold value, which is the average of the values of the T-matrix, was calculated and then all values smaller than the threshold value (0.0407) in the T matrix were considered zero to prevent the creation of minor relationships in the communication network. In the final step, the sum of rows D and columns R as well as $D + R$ and $D - R$ values were calculated. The value of D for each factor indicates the level of influence, the value of R for each factor indicates the level of influence, $D + R$ shows the level of interaction and $D - R$ shows the strength of the influence of each factor; in case of the positive value it is influencing and in case of the negative value it is influenced.

$$D = \sum_{j=1}^n T_{ij} \quad \text{and} \quad R = \sum_{i=1}^n T_{ij}. \quad (4.4)$$

Figure 1 presents the position of each factor in the graph based on the degree of influence; thus, the influencing factors are in the upper positions of the diagram, and the influenced factors are in the lower positions of the diagram. Table 5 shows the importance, nature, and impact factor per factor.

The results of the Dematel technique implementation show that the investment factor is the most influential compared to other factors, and system quality, variety, development of services, and new services are in the next ranks of causal factors. In other words, they are the lever and strategic factors of the system. Also, the intention to use factor shows the highest effectiveness followed by using banking technologies, attitude towards use, and perceived usefulness factors in the next ranks of effectiveness, respectively. And finally, the system quality shows the most interaction in the model, followed by customer satisfaction, use of banking technologies, intention to use, customer trust, variety and development of services, and attitudes to use factors as the next degrees in terms of total influence and effectiveness.

After the Dematel technique implementing, which led to the identification of the effective factors, their nature, and their coefficient of impact on the system components, to present a more accurate and comprehensive picture

Table 4: Direct relationships between factors and their impact coefficient

Factors	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20
M1	0.00	0.00	0.17	0.25	0.17	4.00	0.17	0.00	0.25	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M2	3.00	0.00	0.00	0.25	0.00	3.75	0.00	0.00	0.00	0.00	0.25	0.33	0.00	0.00	0.25	0.00	0.17	0.17	0.25	0.00
M3	4.00	3.25	0.00	4.00	3.25	0.25	0.33	0.00	0.00	0.00	0.25	0.25	0.00	0.25	0.17	0.00	0.00	0.25	0.25	0.00
M4	0.00	0.00	0.25	0.00	3.25	0.00	4.00	0.25	0.00	0.00	3.00	0.00	0.25	0.00	0.00	0.03	0.00	0.17	0.33	0.00
M5	0.00	0.00	0.00	2.50	0.00	3.75	0.75	0.00	0.06	0.00	0.00	0.50	0.25	0.00	0.33	0.33	0.00	0.25	0.33	0.00
M6	0.33	0.25	0.50	0.75	0.25	0.00	4.00	0.00	0.00	0.00	0.33	0.00	0.25	0.00	0.50	0.33	0.00	0.17	0.25	0.00
M7	0.00	0.00	0.00	0.00	0.25	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.17	0.25	4.00	0.00
M8	0.75	0.33	3.50	0.50	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.75	0.00
M9	0.25	0.00	0.33	0.00	0.00	0.00	3.75	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.50
M10	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M11	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	3.00	0.00	3.75	0.00
M12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	2.50	0.00
M13	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M14	0.00	0.00	3.00	3.50	0.00	0.17	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M15	0.00	0.00	0.12	0.00	0.00	0.50	0.00	3.75	0.00	0.25	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.17
M17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	3.75	0.00
M18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M19	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.00	0.00
M20	0.00	0.00	0.25	0.00	0.00	0.00	0.00	3.50	0.00	0.00	0.00	3.00	0.00	0.33	3.50	0.00	0.00	0.00	0.00	0.00

Table 5: Importance, nature and intensity of the influence of factors

	D_i	R_i	$D_i + R_i$	$D_i - R_i$
M1	0.5271	1.0519	1.5790	-0.5249
M2	0.8083	0.5148	1.3230	0.2935
M3	1.9543	1.0299	2.9842	0.9243
M4	1.5038	1.4208	2.9246	0.0830
M5	1.0986	1.0392	2.1377	0.0594
M6	0.6305	1.4425	2.0729	-0.8120
M7	0.5146	1.7465	2.2611	-1.2318
M8	1.4170	0.6005	2.0175	0.8165
M9	0.4587	0.3101	0.7688	0.1486
M10	0.3968	0.6364	1.0333	-0.2396
M11	0.9468	1.0257	1.9724	-0.0789
M12	0.4442	0.0796	0.5239	0.3646
M13	0.3023	0.4395	0.7418	-0.1373
M14	1.1969	0.4026	1.5995	0.7943
M15	1.1745	0.6134	1.7880	0.5611
M16	0.2013	0.4979	0.6991	-0.2966
M17	0.3671	0.7567	1.1239	-0.3896
M18	0.6401	0.7601	1.4002	-0.1200
M19	0.6535	1.8846	2.5380	-1.2311
M20	1.0314	0.0150	1.0464	1.0164

of the reality, the dynamic relationships in the problem are identified with causal loops [75]. Therefore, to better understand the space of relationships in the system, a diagram of cause and effect relationships was presented as dynamic hypotheses (Figure 2).

4.1 Cause-effect relationships and dynamic hypotheses

Based on the relationship model, many factors influence the intention to use a marketed novel technology banking product or service. The intention to use is the result of positive and negative reactions to factors affecting it, including customer satisfaction with the quality of the service delivery system and the customer's attitude, which is influenced by perceived ease and usefulness. In addition, customers' trust in new technology also affects customers' attitudes and their intention to use it. Word of mouth, perceived risk, perceived cost, and the need for interaction, interpreted as the willingness of customers to communicate with bank employees, are important factors with a significant impact on the intention of customers to use banking technologies. In this system, the number of bank transactions increases with the increase in the number of active customers and the more use of the provided services. In addition, active customers who have a great and enjoyable product experience as pioneers expose their friends and relatives to the new product through word of mouth. When people receive word-of-mouth advertising messages, they tend to see the recommended product as an opportunity to achieve positive results, so some are persuaded to try the new product or

preferences, demands, and customer needs through providing feedback to the company that leads to innovation, development of contact points, and improvement of the existing product is defined as "customer knowledge value" and is considered as the result of customer participation in the co-creation of the company's value [43]. Considering that different transactions have different commission rates depending on the type of service provided, they also create certain revenues for the bank. On the other hand, bank transactions related to the provided services also impose their costs on the bank, which must be deducted from the revenues from the services to lead to the net profit of banking transactions. A part of this profit is spent in the form of investment in the creation and maintenance of required infrastructure, development of banking services and tools, advertising and marketing, knowledge development, and related activities. Based on research findings, investment is the most important influencing factor in the model.

Hypothesis 2: Simultaneous investment in advertising and marketing, service development, and customer knowledge increases customer participation in value co-creation.

4.2 Flow accumulation model

Flow accumulation models are used to eliminate the limitation of cause-and-effect models in displaying flow and state structures. These models are the result of rendering the cause and effect diagrams variables into the flow accumulation variables and compiling the relevant mathematical equations based on real data (Figure 3).

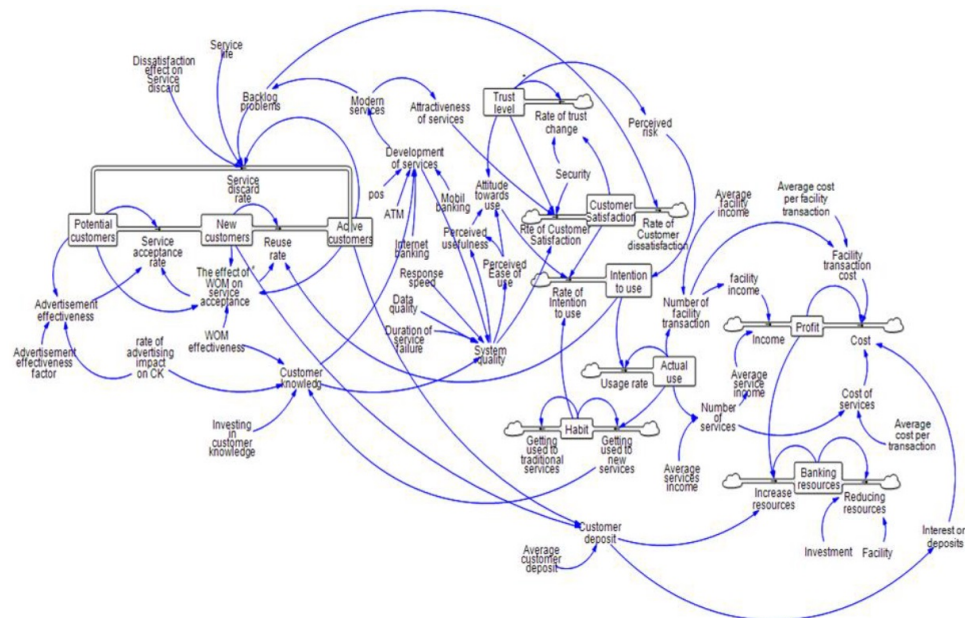


Figure 3: Accumulation model and research flow

4.3 Dynamic validity of the model

In dynamic systems modelling, model validation seeks to ensure and confirm the model structure and behavior in providing a reliable picture of reality. In this article, the model's main structure was built through the literature review, the results and relationships resulting from the implementation of the Dematel technique and interviews with banking and marketing industry experts, and the real data of a state-owned bank were used to set the reference of the model. In other words, the proposed model is based on a "structure verification test". "Behavior reproduction test" was used to test the behavioral validity of the model. In this test, the profit and loss of the Bank were used to measure the value in the banking industry. The results of this test, which are shown in the graphs of Figure 4, indicate that the model behavior matches reality.

4.4 Introduction and review of scenarios

According to the expert's opinion regarding the leverage points identified through the Dematel technique and the proposed hypotheses, the following scenarios are presented as policy packages to increase customer participation in the banking industry value co-creation.

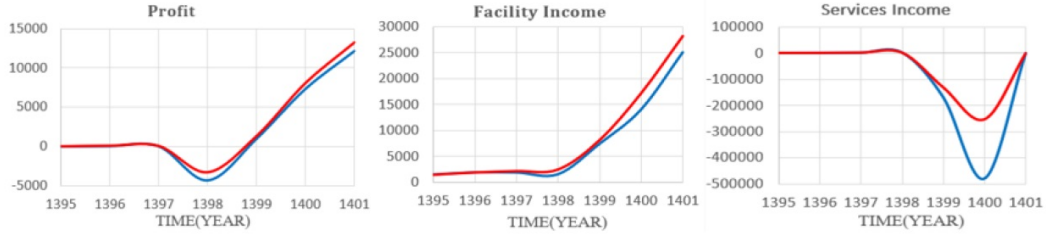


Figure 4: Comparison of simulation results with real data

Scenario 1: Continuation of the status quo: In this scenario, no changes are applied to the system structure and the values of the studied parameters, and only the continuation of status quo consequences are predicted from the performance indicators perspective based on the designed model.



Figure 5: The results of applying scenario 1

As the system simulation results show, with the continuation of the status quo, active customers and the bank's profits will continue to grow until the next two years, and with the simultaneous increase in costs and the activation of limiting loops, such as the accumulation of problems and service life, this growth process will stop.

Scenario 2: Increasing marketing and advertising activities: In this scenario, we try to increase the number of potential customers into active customers by increasing marketing and advertising activities.

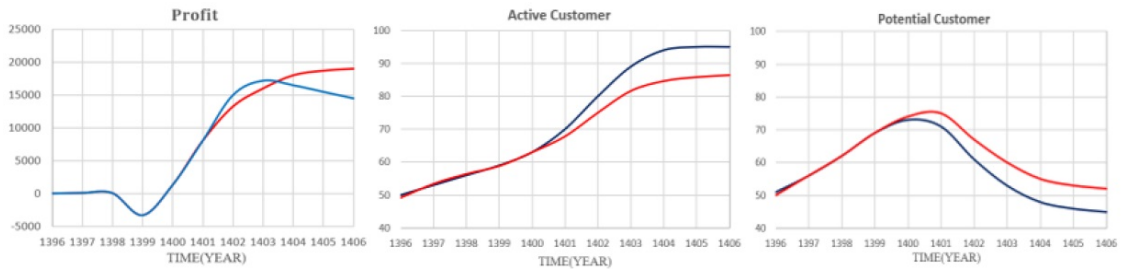


Figure 6: Results of applying scenario 2

The application of this scenario, which is accompanied by the bank's incentive policies to increase customer referrals, word of mouth advertising and improve the level of customer awareness of the services, will increase the number of active customers, the intention to use, and increase bank transactions, and as a result, it will reduce the population of potential adopters. On the other hand, higher advertising costs compared to transaction profits resulting from advertising activities will cause an unexpected decrease in bank profits in the long term. Therefore, this policy alone is not a sustainable solution for the growth of bank profits.

Scenario 3: simultaneous investment in advertising and marketing, service development, and customer knowledge: This scenario targets the sets of factors affecting customers' intention to use so that by strengthening them, more people will be encouraged to try and use the products.

By applying this scenario, potential customers get to know the new banking product or service through advertising and marketing activities, which leads to the product being used by them, and with a little time delay, they become

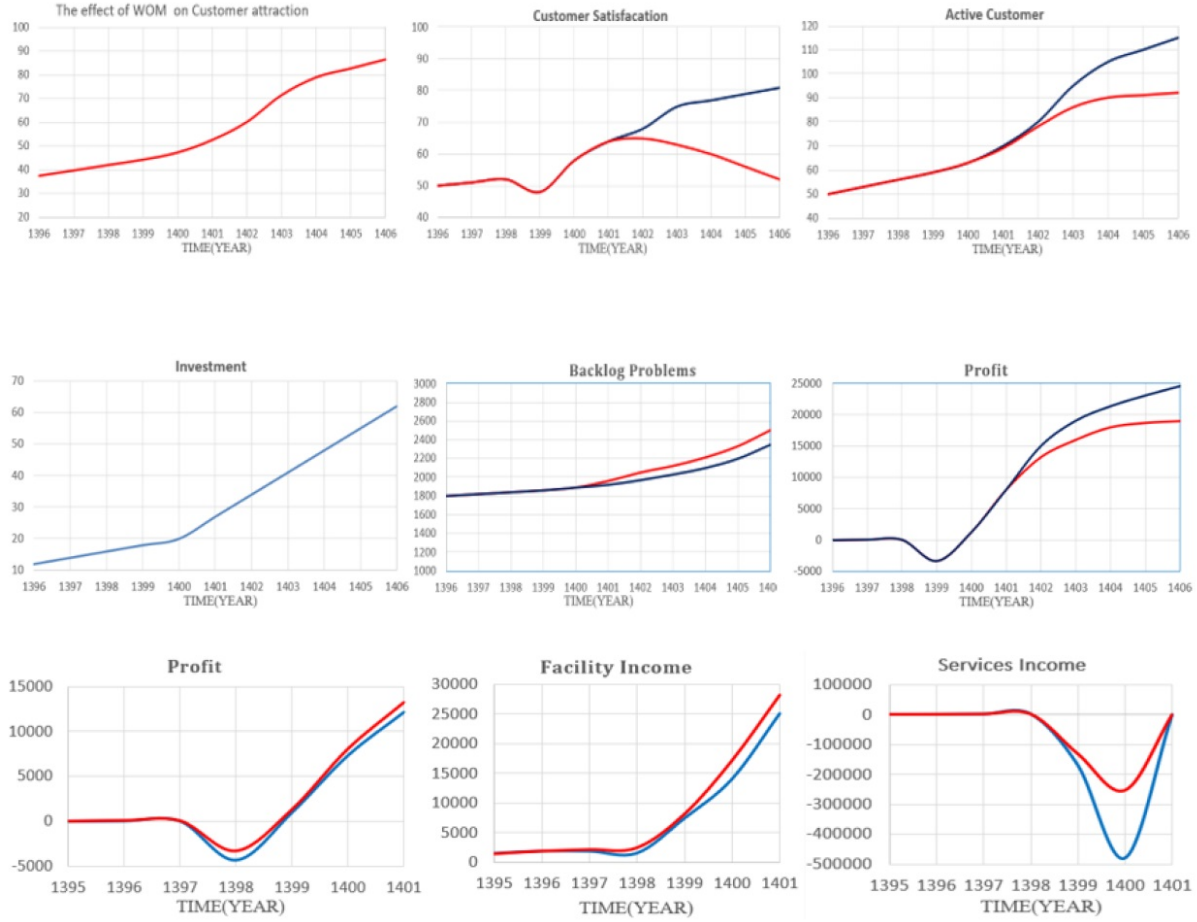


Figure 7: Results of applying scenario 3

actual customers. With the passage of time and more use of new services, which are also associated with a little time delay, a kind of habit of using the new service intensifies in customers. The negative effect of customers' resistance to new technologies also decreases over time with the increase of habit to adopt the novel system, and by influencing the attitude that shapes the customer's behavior, it increases the intention of the bank's customers to use the new technological service. On the other hand, active and new customers who have used the bank's services and products provide feedback to the company to improve the quality of the products and services and strengthen the intention to use the services through word of mouth. This has caused an increase in the number of active customers and an increase in customer transactions per capita, and ultimately leads to higher levels of the bank's net profit. On the other hand, the growth limiters such as the accumulation of problems and service life, with the simultaneous growth of the active customers number and per capita banking transactions, have been activated and created a kind of uncertainty in the minds of some customers, and a percentage of them leave the use of services and return to the group of potential customers. The impact of these problems is also diminished by the development of service delivery infrastructure and the involvement of customers in the service recovery process.

In general, this policy package implementation results will improved customer knowledge, improved service quality, reduced uncertainty, increased customer satisfaction, and provides a relative reduction in system problems, and it is considered a suitable policy to achieve sustainable improvement.

5 Discussion and conclusion

Creating shared value with customers through customer and organization resources integration is one of the requirements of the new marketing paradigm, and the practical consequences of companies that are focused on customer participation in value creation indicate increased sales, repeated purchases, and stronger financial performance than competitors. Accordingly, to explain the value of customer participation in the value co-creation in the banking in-

dustry, 20 factors affecting the research subject were identified by an extensive review of the research literature in the library method as well as interviews with experts, headquarters, and line managers in the banking network, and the Dematel technique, which is a multi-criteria decision-making technique, was used to determine and evaluate the relationships between the factors. The analysis results showed that the investment factor was the most influential, the intention to use factor was the most influential, and system quality and customer satisfaction showed the most interaction among the factors. Moreover, causal loops were presented in the form of a dynamic model to gain a comprehensive view of the system and better understand the relationships between the main factors of the system and the value of customer participation.

The results showed that banks need to become a leading organization in providing new and technological products and services to create a competitive advantage in the prevailing competitive environment. Nonetheless, any investment in providing new services, product development, as well as investment in marketing and advertising, without considering the needs of customers, will not significantly improve the company's performance. Therefore, based on the organization's policies, a percentage of the company's financial power is allocated to investing in customer knowledge. Increasing customer knowledge leads to product diversification and development, providing novel services based on customer needs and personalizing services. On the other hand, customer knowledge has a positive effect on product quality, and through it, it also has a positive effect on the customer's satisfaction, trust, attitude, and intention to use. In other words, investing in customer knowledge management enables banks to identify their needs by analyzing the customers' information and knowledge and achieve the best results in service management in the shortest possible time. Consequently, this leads to customer satisfaction and increases the customer's lifetime value. And finally, more use of services increases the bank's income and financial power and provides the possibility of more investment. The intention to use, as the most permeable factor of the system, is affected by customers' satisfaction, trust, and attitude. Unlike customer satisfaction, which has a positive effect on word-of-mouth advertising, customer trust does not have a direct effect on word-of-mouth advertising. Therefore, customer trust alone is not enough to recommend to others and word-of-mouth advertising, but customers who have a higher level of satisfaction and trust are willing to buy from the company again and can recommend others to experience interaction with the company. Of course, customer satisfaction is a provider of repeated purchases and word-of-mouth advertising if the customer trusts the company's services in terms of attitude and behavior. On the other hand, the attitude toward the use of customers is influenced by the perceived usefulness and ease of use of services. Inhomogeneous markets, such as banking services, where financial services are provided with almost the same perceived usefulness and cost, improving customer attitudes through increasing the ease of use of services is of significant importance for managers. Therefore, the convenience and ease of using the service are considered a competitive advantage. This point is more tangible for service providers whose customers are often outside the physical boundaries of the service provider and use non-personal services such as Internet Banking and Mobile Banking.

The findings also suggest that managers use customer databases and two-way information-sharing technologies to efficiently manage communication with customers and improve their satisfaction and participation. Therefore, companies should also provide a practical service experience environment for customers to achieve the highest effectiveness in this process, in addition to strengthening theoretical knowledge. This provides the basis for further product development, providing novel services based on customer needs and personalized services.

The findings show that it is important for customers to feel valued in their participation and to be appreciated for their participation in providing services by the company. Additionally, it is critical to demonstrate that previous customer participation programs have improved the experience of other customers and are recognized as having an impact on the organization to increase customer participation value. The spread of social media also provides a valuable opportunity for banks to provide some form of feedback for customer participation. In addition, bank managers can use social media to encourage customers to participate, exchange information, provide financial advice, personal support, and establish mutual friendships with customers. Theoretically, customer participation in service delivery is a new addition to the main perspective in customer satisfaction literature, and the value of customer participation is a predictor of customer satisfaction and an important mediating variable between customer participation and customer satisfaction. Considering the practical implications, companies seeking to increase customer satisfaction should prioritize customer participation and use new technologies and innovative methods to increase the value of customer participation, because they significantly improve customer satisfaction. In different environments, customer participation may have different or similar effects on customer satisfaction and industry value co-creation. Accordingly, further research in different settings will be critical for theory formulation. Some other factors and variables were not discussed in this study due to the complexity and lack of accurate information. Therefore, it is necessary to identify other effective variables and their effects on the banking industry value co-creation model in future research.

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